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(54) **Composition for dyeing of human hair**

(57) The dyeing effect, i.e. the color absorption, and the stability of a composition for dyeing of human hair comprising at least one direct dyestuff in an aqueous or aqueous-alcoholic medium are considerably improved by the addition of 0.1% to 7.5% by wt., calculated to the total composition, of at least one hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl Guar gum or the quaternary salts thereof, particularly from 0.25% to 2.5% by wt. of hydroxypropyl Guar gum.

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## Description

This invention comprises a composition for permanent or semi-permanent dyeing of human hair providing an improved dyeing effect and increased stability.

It is known that hair dyeing compositions are generally classified into two categories, i.e., on the one hand permanent dyeing compositions comprising oxidation dyestuff precursors, which react with oxidizing agents to develop the desired hair coloration depending on the formula chosen; and semi-permanent hair dyeing compositions containing direct dyes which do not need any addition of oxidising agents to develop their dyeing effect. Obviously, their dyeing results are less durable than those obtained with permanent dyeing compositions.

Dyeing compositions on the basis of direct dyes are usually applied as tinting shampoos, tinting lotions or color setting lotions, optionally also as aerosol foams.

In the case of solutions or lotions, these compositions frequently contain stabilisers with thickening effect, particularly cellulose derivative such as hydroxyethyl cellulose.

The stability and the dyeing effect achieved by the use of these compositions, however, are not satisfactory.

Accordingly, there was a need for hair dyeing compositions on the basis of direct dyes which are stable and provide an improved dyeing result compared with customary compositions.

The invention provides a composition for dyeing of human hair containing at least one direct dye and, additionally, from 0.1% to 7.5%, preferably from 0.25% to 5%, particularly from 0.5% to 2.5% by wt., calculated to the total composition, of at least one hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl Guar gum and (or) of a quaternization product thereof.

Due to the addition of hydroxyalkyl Guar derivatives, the dyeing effect of the composition, i.e. its dye absorbing capacity, is essentially increased compared with conventional products; moreover, the composition shows also excellent stability.

The pH-value of the composition according to the invention is within the range from 2 to 10, preferably from 4 to 9, particularly from about 6 to about 8.

A preferred hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl Guar gum derivative, which is used in the hair dyeing compositions according to the invention in a proportion of 0.1% to 7.5, preferably from 0.25% to 5%, particularly from 0.5% to 2.5% by wt., is hydroxypropyl Guar, i.e. the propyleneglycol ether of Guar gum as well as a quaternization product thereof, particularly hydroxypropyl Guar hydroxypropyl trimonium chloride. Further suitable hydroxyalkyl Guar derivatives are, e.g., hydroxyethyl Guar, hydroxybutyl Guar and the quaternization products thereof.

Suitable products are on the market under the trade names "Jaguar HP®", "Jaguar C-17®", and "Jaguar C-162®" as well as "Galactosol®".

On principle, all direct dyestuffs admitted for this purpose may be used as direct hair dyes; in this respect reference is made to the German Cosmetic Regulations, "Verordnung über kosmetische Mittel (Kosmetik-Verordnung)", in its latest version, Annex No.3.

Preferred dyestuffs are cationic (basic) dyes since their stability and absorptive properties are particularly enhanced by the addition of Guar gum derivatives according to the invention.

Particularly suitable basic (cationic) dyestuffs are

Basic Blue 6,	C.I.-No. 51,175;
Basic Blue 7,	C.I.-No. 42,595;
Basic Blue 9,	C.I.-No. 52,015;
Basic Blue 26,	C.I.-No. 44,045;
Basic Blue 41,	C.I.-No. 11,154;
Basic Blue 99,	C.I.-No. 56,059;
Basic Brown 4,	C.I.-No. 21,010;
Basic Brown 16,	C.I.-No. 12,250;
Basic Brown 17,	C.I.-No. 12,251;
Basic Green 1,	C.I.-No. 42,040;
Basic Red 2,	C.I.-No. 52,240;
Basic Red 22,	C.I.-No. 11,055;
Basic Red 76,	C.I.-No. 12,245;
Basic Violet 1,	C.I.-No. 42,535;
Basic Violet 3,	C.I.-No. 42,555;
Basic Violet 10,	C.I.-No. 45,170;
Basic Violet 14,	C.I.-No. 42,510;
Basic Yellow 57,	C.I.-No. 12,719.

The following may be used as acid (anionic) dyestuffs:

	Acid Black 1,	C.I.-No. 20,470;
	Acid Blue 9,	C.I.-No. 42,090;
	Acid Blue 74,	C.I.-No. 73,015;
	Acid Red 18,	C.I. No. 16,255;
5	Acid Red 27,	C.I. No. 16,185;
	Acid Red 87,	C.I. No. 45,380;
	Acid Red 92,	C.I. No. 45,410;
	Acid Violet 43,	C.I. No. 60,730;
	Acid Yellow 1,	C.I. No. 10,316;
10	Acid Yellow 23,	C.I. No. 19,140;
	Acid Yellow 3,	C.I. No. 47,005;
	D&C Brown No.1,	C.I. No. 20,170;
	D&C Green No.5,	C.I. No. 61,570;
	D&C Orange No.4,	C.I. No. 15,510;
15	D&C Orange No.10,	C.I. No. 45,425;
	D&C Orange No.11,	C.I. No. 45,425:1;
	D&C Red No.21,	C.I. No. 45,380:2;
	D&C Red No.27,	C.I. No. 45,410:1;
	D&C Red No.33,	C.I. No. 17,200;
20	D&C Yellow No.7,	C.I. No. 45,350:1;
	D&C Yellow No.8,	C.I. No. 45,350;
	FD&C Red No.4,	C.I. No. 14,700;
	FD&C Yellow No.6,	C.I. No. 15,985.

25 The proportion of direct dyes in the compositions according to the invention may be varied from about 0.01% to about 1.5%, preferably 0.05% to 1%, particularly 0.1% to 0.5% by wt. of the total composition.

The hair dyeing composition according to the invention preferably comprises at least one synthetic or natural hair conditioning polymer, preferably in a proportion from about 0.1% to 2.5%, particularly 0.25% to 1.5% by wt. of the total composition. Although any kind of polymers may be used, i.e. non-ionic, anionic, amphoteric and cationic polymers, cat-  
30 ionic polymers are preferred within the scope of the invention.

Particularly suitable in this respect are the well-known quaternary cellulose derivatives of the type "Polymer JR", quaternized homo- and copolymers of dimethyl diallyl ammonium chloride, being on the market under the trade name "Merquat", quaternary vinyl pyrrolidone copolymers, especially with dialkyl aminoalkyl (meth)acrylates known under the trade name "Gafquat", copolymers from vinyl pyrrolidone and vinyl imidazolinium methochloride offered on the market  
35 under the trade name "Luviquat", polyamino-polyamide derivatives, e.g., copolymers of adipic acid dimethyl aminohydroxypropyl diethylene triamine sold under the name "Cartaretine F", as well as also bisquaternary long-chain ammonium compounds of the urea structure described in US Patent 4,157,388 being marketed under the trade name "Mirapol A 15".

In this context, reference is also made to the cation-active polymers described in German Patent Applications Nos.  
40 25 21 960, 28 11 010, 30 44 738, and 32 17 059, and the products listed in European Patent Application No. 337,354, pp.3 to 7. Mixtures of different cationic polymers may also be used.

Nonionic polymers may also be used instead of cationic polymers or combined with those. Suitable nonionic polymers are mainly polyvinyl pyrrolidone homo- and copolymers, particularly polyvinyl pyrrolidone, copolymers of vinyl pyrrolidone and vinyl acetate or terpolymers of vinyl pyrrolidone, vinyl acetate and vinyl propionate, as they are, e.g., sold  
45 by BASF under the trade name "Luviskol".

However, (co-)polymers of different acrylic and methacrylic esters, acrylamide and methacrylamide, e.g., polyacrylamide having a molecular weight exceeding 100,000, dimethylhydantoin formaldehyde resins, etc., are also suitable. Of course, mixtures of different nonionic polymers are also applicable.

Suitable anionic polymers within the scope of the invention are vinyl alkyl ether, particularly methyl vinyl ether/maleic acid copolymers, prepared by hydrolysis of vinyl ether/maleic acid anhydride copolymers and sold under the trade name "Gantrez AN or ES". These polymers may be partially esterified, e.g., "Gantrez ES 225", the ethyl ester of an ethyl vinyl ether/maleic acid copolymer or the butyl or isobutyl ester thereof.  
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Other suitable anionic polymers are particularly copolymers of vinyl acetate/crotonic acid or vinyl acetate/vinyl neodecanoate/crotonic acid of the type "Resyn"; copolymers of sodium acrylate/vinyl alcohol of the type "Hydagen F", sodium polystyrene sulfonate, e.g. "Flexan 130"; copolymers of ethyl acrylate/acrylic acid/N-tert.-butyl acrylamide of the type "Ultrahold"; copolymers of vinyl pyrrolidone/vinyl acetate/itaconic acid, copolymers of acrylic acid/acrylamide or the sodium salts thereof of the type "Reten"; etc.  
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On principle, all anionic polymers suggested for hair preparations may be used.

As amphoteric polymers which are used either as an alternative to or in admixture with the other polymers, partic-

ularly cationic polymers, preferably copolymers of N-octyl acrylamide, (meth)acrylic acid and tert.-butyl aminoethyl methacrylate of the type "Amphomer" are named; as well as copolymers of methacryloyl ethyl betaine and alkyl methacrylates of the type "Yukaformer", e.g., butyl methacrylate copolymer "Yukaformer AM75"; copolymers from monomers bearing carboxylic or sulfo groups, e.g., (meth)acrylic acid and itaconic acid with monomers containing basic groups, particularly amino groups such as mono- and dialkyl aminoalkyl (meth)acrylates or mono and dialkyl aminoalkyl (meth)acrylamides; copolymers of n-octylamide, methyl methacrylate, hydroxypropyl methacrylate, N-tert.-butyl aminoethyl methacrylate and acrylic acid and the copolymers disclosed in US Patent No.3,927,199.

The hair dyeing compositions according to the invention may comprise all additives usual in these preparations, whose type and character depend on the kind of application. These are surfactants, particularly anionic surfactants such as long-chain N-acylamino carboxylic acids and the salts thereof, e.g. N-lauroyl sarcosinate and glutamate, amphoteric surfactants such as betaines, e.g., cocoamidopropyl betaine, as well as nonionic and cationic surfactants, fats, fatty alcohols, emulsifiers, pH-regulants, solvents and compounding agents, solubilizers, preservatives, perfumes, etc.

The hair dyeing compositions according to the invention are formulated as emulsions, dispersions or solutions and may also be applied as aerosol foams. These compositions and their production are basically known to the expert and need no further explanation.

Particularly preferred are aqueous or aqueous-alcoholic solutions, for instance on the basis of 80% to 95% water and 5% to 20% lower alcohol such as ethanol, n-propanol or isopropyl alcohol.

The following examples describe the composition of preparations according to the invention and show their superiority compared with customary products.

#### Examples

	No.1 Light-brown % by wt.	No.2 Mahogany % by wt.	No.3 Mid-blond % by wt.
Hydroxypropyl Guar	1.00		
Guar hydroxypropyl trimonium chloride		1.00	
Hydroxypropyl Guar hydroxypropyl trimonium chloride			2.00
Polyquaternium-7	0.80	0.80	0.80
Cocoamidopropyl betaine	1.00	1.00	1.00
Dimethicone Copolyol	0.10	0.10	0.10
Ethanol	5.00	5.00	5.00
Perfume	0.20	0.20	0.20
Basic Blue 99	0.066		
Basic Red 76		0.030	
Basic Brown 16			
Basic Yellow 57			
Basic Brown 17	0.050	0.200	0.036
Disperse Black 9	0.004		0.077
Disperse Blue 3	0.015	0.040	0.019
HC Red No. 3	0.060	0.360	0.024
Water ad	100.00	100.00	100.00

Replacing hydroxypropyl Guar or its quaternization products by the same amount of hydroxyethyl cellulose led to products whose dye absorptive properties, i.e., their coloration power, after 30 minutes processing time at 30°C on average, were 20% to 25% lower than that of the compositions according to the invention.

Claims

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1. Composition for dyeing of human hair, comprising at least one direct dye in an aqueous or aqueous-alcoholic medium, containing from 0.1% to 7.5% by wt., calculated to the total composition, of at least one hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl Guar gum or the quaternary salts thereof.
  2. Composition according to claim 1, containing 0.25% to 2.5% by wt., calculated to the total composition, of at least one hydroxyalkyl Guar gum or the quaternary salts thereof.
  - 10 3. Composition according to claim 1 or 2, containing as hydroxyalkyl Guar gum hydroxypropyl Guar gum or a quaternary salt thereof.
  4. Composition according to one or more of claims 1 to 3, characterized in that it contains at least one cationic dyestuff as direct dye.
  - 15 5. Composition according to one or more of claims 1 to 4, characterized in that it has a pH-value between 4 and 9.
  6. Composition according to one or more of claims 1 to 5, characterized in that it contains from 0.1% to 2.5%, calculated to the total composition, of at least one hair conditioning polymer.
  - 20 7. Use of at least one hydroxy-C<sub>2</sub>-C<sub>4</sub>-alkyl Guar gum or of the quaternary salts thereof to increase the coloring power of compositions for dyeing and re-dyeing of human hair on the basis of at least one direct hair dyestuff in an aqueous or aqueous-alcoholic medium.

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